IN THE CLAIMS:

1 – 43 (Canceled)

44. (Currently Amended) A method of determining at least one condition variable from a model of an RTP system by means of at least one measurement signal, the measurement value, detected at the RTP system and having dependency upon the condition variable that is to be determined, and by means of a measurement value, the predicted value, predicted by means of the model, wherein the measurement value and the predicted value each comprise components of a constant portion and a changeable portion, the method including the steps of

separately establishing at least the changeable portion by a filter to form a first difference between the changeable portion of the measurement value and the changeable portion of the measurement value predicted by the model;

adapting at least one model parameter by feeding the first difference back into the model with the aim of adapting the model behavior to variable system parameters;

forming a second difference from the measurement value and the predicted value, or from the measurement value corrected by the changeable portion and the ~~corrected~~ predicted value <u>corrected by the changeable portion</u>;

correcting a condition of the model system by feeding the second difference back into the model with the aim of bringing the condition of the model system into correspondence with that of the real system; and

detecting at least one condition variable ~~at the model~~ <u>from the model</u>.

45. (Previously Presented) A method according to claim 44, wherein the feeding of the first difference back takes place by means of a first valuation function and a first control algorithm and/or the feeding of the second difference back takes place by means of a second valuation function and a second control algorithm.

46. (Currently Amended) A method according to claim 44, wherein the RTP system is a rapid heating unit with which ~~an object, such as~~ a semiconductor wafer, is heated with radiation sources, and/or the model includes at least one ~~object~~ <u>semiconductor wafer</u> heated in the RTP system~~, such as one semiconductor wafer,~~ and forms a system model.

47. (Currently Amended) A method according to claim 46, wherein in order to modulate radiation sources by means of an actuation value, different radiation sources are actuated

with different modulation parameters to clearly adapt ~~several model~~ transmissivity and/or reflectivity parameters, ~~such as transmissivity and/or reflectivity~~, of a semiconductor wafer.

48. (Currently Amended) A method according to claim 47, wherein modulation is produced and represented by a continuous, though not necessarily periodic, stimulus~~, such as~~ by means of pseudo random sequences, colored noises, or ~~also~~ by stimuli of ~~the~~ a set value of the radiation sources caused parasitically in the system by interference.

49. (Currently Amended) A method according to claim 44, wherein the condition variable comprises at least a temperature of ~~the~~ a semiconductor wafer.

50. (Currently Amended) A method according to claim 44, wherein the system model takes into account the optical properties of a wafer by means of model parameters, and wherein ~~the~~ optical properties of the wafer in the system model are adjusted to the real optical properties of the wafer in a rapid heating unit.

51. (Currently Amended) A method according to claim 48, wherein the measurement value has a changeable portion that depends substantially upon ~~the~~ optical properties of a wafer and is produced by a modulation of the radiation sources, and wherein ~~the~~ adjustment of the optical properties takes place by means of an algorithm that adjusts the changeable portion in the ~~recorded~~ detected measurement value and that of the predicted measurement by adaptation of ~~the~~ optical properties of the wafer in the system model.

52. (Previously Presented) A method according to claim 51, wherein the optical properties of the wafer comprise the emissivity and/or the reflectivity and/or the transmissivity.

53. (Previously Presented) A method according to claim 4.6, wherein the measurement value comprises at least radiation that is coming from a semiconductor wafer and that is collected by a pyrometer.

54. (Previously Presented) A method according to claim 53, wherein the collected radiation comprises at least heat radiation from the semiconductor wafer and radiation from the radiation sources reflected at the semiconductor wafer.

55. (Previously Presented) A method according to claim 44, wherein determination of the predicted value of the measurement value comprises determination of a predicted value of a semiconductor wafer radiation which predicts a portion of a pyrometer signal caused by the wafer.

56. (Currently Amended) A method according to claim 55, wherein the determination of the predicted value of the wafer radiation comprises determination of an intensity value~~ of the heat radiation ~~of ~~the~~ a semiconductor wafer radiation in the area of a measurement wavelength of the pyrometer using the established condition variable and an established emissivity of the semiconductor wafer.

57. (Previously Presented) A method according to claim 56, wherein the determination of the predicted value of the wafer radiation is effected using a model, taking into account the intensity value of the wafer radiation in the area of the measurement wavelength of the pyrometer and an established emissivity of the semiconductor wafer.

58. (Previously Presented) A method according to claim 57, wherein the model takes into account an influence of a rapid heating unit chamber upon the established emissivity of the semiconductor wafer.

59. (Currently Amended) A method according to claim 55, wherein the determination of the predicted value of the measurement value comprises determination of a lamp predicted value which predicts a portion of a pyrometer signal caused by ~~the~~ radiation sources.

60. (Previously Presented) A method according to claim 59, wherein the determination of the lamp predicted value comprises the determination of a broadband intensity value of the heat radiation of the semiconductor wafer using the established condition variable and an established emissivity of a semiconductor wafer.

61. (Currently Amended) A method according to claim 59, wherein the determination of the lamp predicted value comprises the determination of an intensity value of the radiation sources using a lamp model and the actuation value of the radiation sources.

62. (Previously Presented) A method according to claim 61, wherein the lamp model takes into account interactions between the semiconductor wafer and the individual radiation sources.

63. (Currently Amended) A method according to claim 62, wherein the lamp model uses ~~the~~ a predicted broadband intensity value of the heat radiation of the semiconductor wafer as an input value.

64, (Previously Presented) A method according to claim 61, wherein the lamp model takes into account interactions between the individual radiation sources.

65. (Currently Amended) A method according to claim 61, wherein the radiation sources are combined as groups and ~~the~~ an intensity value ~~is determined~~ for the radiation sources is determined for the respective groups.

66. (Previously Presented) A method according to claim 65, wherein the determination of the intensity value for the radiation sources for the respective groups is effected using at least two representatives of the group.

67. (Previously Presented) A method according to claim 65, wherein the radiation sources are actuated at least within one group with the same value.

68. (Currently Amended) A method according to claim 59, wherein when determining the lamp predicted value, a model is used that predicts the portion of the lamp radiation that is reflected at the semiconductor wafer and that falls in the visual field of the pyrometer, and wherein this is accomplished using ~~the~~ a determined intensity value of the radiation sources and an established emissivity of the semiconductor wafer.

69. (Previously Presented) A method according to claim 68, wherein the model establishes the reflectivity of the semiconductor wafer.

70. (Previously Presented) A method according to claim 69, wherein the reflectivity is established using the established emissivity.

71. (Previously Presented) A method according to claim 68, wherein the model takes into account the chamber geometry of a rapid heating unit.

72. (Previously Presented) A method according to claim 59, wherein the predicted value of the measurement value is formed by adding the predicted value of the wafer radiation and the lamp predicted value.

73. (Previously Presented) A method according to claim 72, wherein the predicted value of the wafer radiation essentially includes a constant portion of the predicted value of the measurement value, and wherein the lamp predicted value essentially includes a constant portion and a changeable portion of the predicted value of the measurement value.

74. (Previously Presented) A method according to claim 55, wherein the emissivity of the semiconductor wafer is established at least partially from the predicted value of the measurement value.

75. (Currently Amended) A method according to claim 74, wherein the predicted value of the measurement value is filtered to establish the changeable portion thereof that

essentially corresponds to the modulated portion of the radiation originating from ~~the~~ radiation sources and reflected at the semiconductor wafer, which radiation falls in the pyrometer from a measurement point on the semiconductor wafer.

76. (Previously Presented) A method according to claim 75, wherein the emissivity of the semiconductor wafer is established using an adaptive algorithm that compares the changeable portion of the predicted value of the measurement value and a changeable portion recorded by the pyrometer and originating from the radiation of at least one measurement point on the semiconductor wafer.

77. (Currently Amended) A method according to claim 46, wherein a semiconductor wafer is rotated in the rapid heating unit, and ~~the~~ a rotation speed and/or a rotation phase in the model is taken into account for establishing the emissivity and/or optical fluctuations of the wafer and/or of a wafer carrier of the semiconductor wafer.

78. (Previously Presented) A method according to claim 77, wherein an established emissivity is scaled before it is taken on to other processes.

79. (Previously Presented) A method according to claim 46, wherein a semiconductor wafer in the model for establishing a condition variable is seen as a black body.

80. (Previously Presented) A method according to claim 44, wherein the RTP system comprises at least one heating device that is modulated with regard to the heat energy it gives out, and wherein the measurement value is established on an object that, due to its thermal properties and/or its thermal coupling to the modulated heating device, only immaterially follows the modulation of the heating device with regard to its temperature.

81. (Previously Presented) A method according to claim 80, wherein the object is a semiconductor wafer, a cladding that at least partially surrounds at least one semiconductor wafer, a chamber wall of a process chamber of the RTP system, or a item in the vicinity of a semiconductor wafer.

82. (Previously Presented) A method according to claim 44, wherein the measurement value is established by means of a pyrometer and/or a thermocouple element.

83. (Currently Amended) A method according to claim 82, wherein the condition variable ~~of the condition~~ is the temperature of the object.

84. (Currently Amended) A method according to claim 83, wherein the condition variable ~~of the condition~~ is the temperature of a semiconductor wafer, and wherein the measurement

value is established on the semiconductor wafer and/or on an item in the vicinity of the semiconductor wafer.

85. (Currently Amended) A method according to claim 44, wherein the model parameters comprise reflectivity, ~~the optical~~ transmissivity and/or emissivity properties of the semiconductor wafer. ~~object, such as reflectivity, transmissivity and/or emissivity.~~